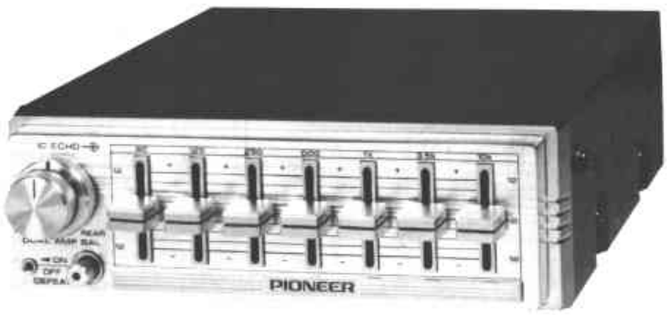
CD-7

U,C,E

COMPONENT CAR STEREO
GRAPHIC EQUALIZER

SERVICE MANUAL



Subject:
Only amplifier units CD-7/U,C Serial No.00001 ~ 12000 are different. The schematic circuit diagram is on page 7, and the amplifier unit is on page 14. For CD-7/E and CD-7/U,C from Serial No.12001 on, see page 5 for the schematic circuit diagram and page 11 for the amplifier unit.

SPECIFICATIONS

Power source	DC 13.8V (11 ~ 16V allowable)
Grounding system	Negative type
Dimensions (WxHxD)	150 x 50 x 167mm (5-7/8 x 2 x 6-5/8 in.)
Weight	1.1kg (2.4 lbs.)
Graphic range	
Equalization frequency	60Hz, 125Hz, 250Hz, 500Hz, 1kHz, 3.5kHz, 10kHz
Equalization range	±12dB
Frequency response	20 ~ 30,000Hz (−3dB)
Harmonic distortion	No more than 0.09% (1kHz, 70mV)
Signal-to-noise ratio	More than 70dB
Input impedance	5kΩ
Output impedance	1kΩ
Max. output level	200mV/1kHz, 1% THD
Reverberation time	0 ~ 0.7 sec.: adjustable

Note:
Specifications and the design subject to possible modification without notice due to improvements.

PIONEER®

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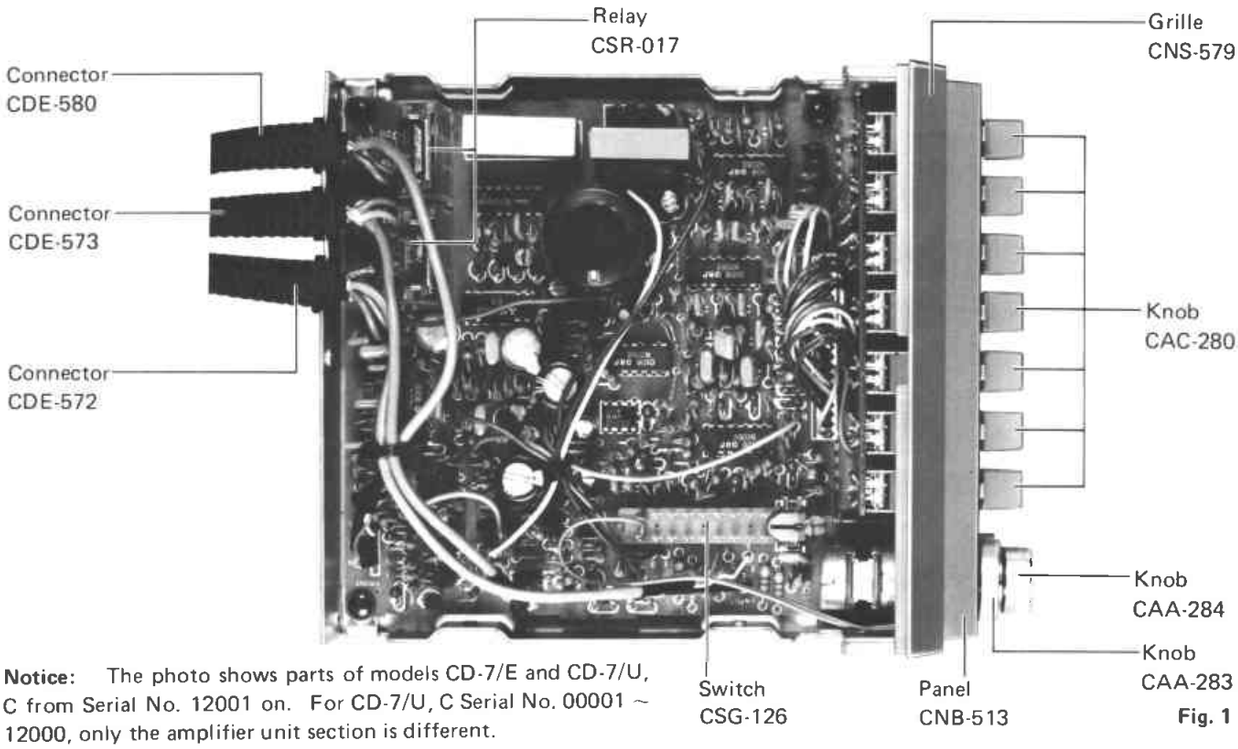
1. PARTS LOCATION



Notice: The photo shows parts of models CD-7/E and CD-7/U, C from Serial No. 12001 on. For CD-7/U, C Serial No. 00001 ~ 12000, only the amplifier unit section is different.

Fig. 1

2. CIRCUIT DESCRIPTION

- **Level Diagram**

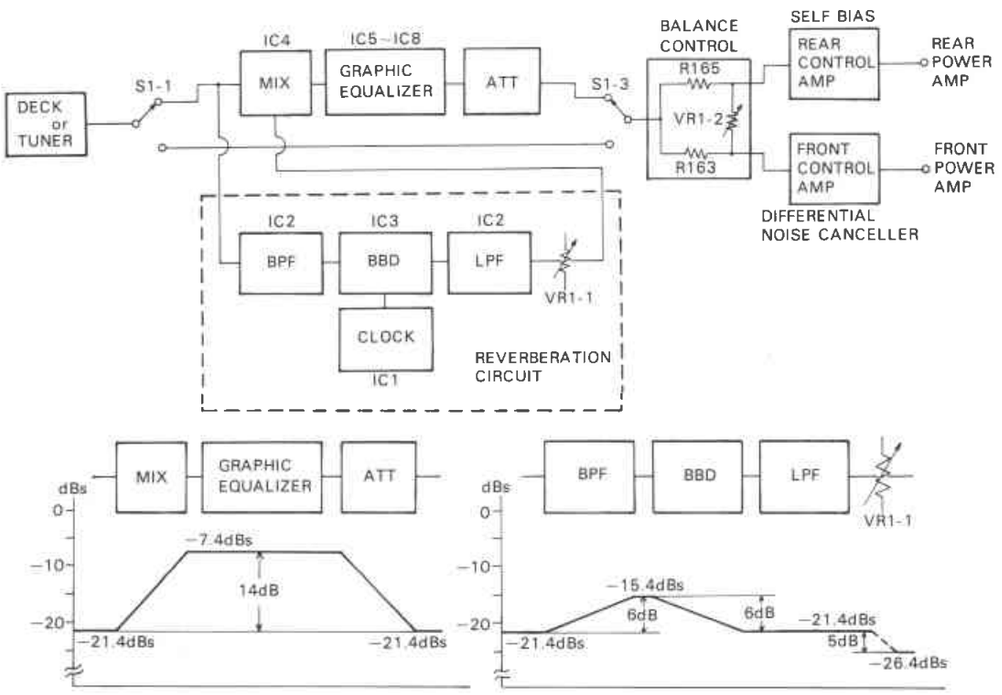


Fig. 2

• Reverberation Circuit

The BBD (bucket brigade device) analog delay element featured in this circuit is connected in series to a P-channel MOS analog switch driven by a clock circuit. Successive analog signals applied to the BBD are thus delayed. Clock frequency is 13kHz, and delay time is approx. 80 msec.
This BBD consists of 2048 stages. The reverberation effect is produced by extracting the L + R signal, forming the echo component, and then mixing this component with the original signal at a level of −5dB. In order to eliminate noise and sluggishness in the low frequency region, the 300Hz to 1600Hz portion of the frequency response is reduced by 3dB in the section from the BPF input to the LPF output. Deterioration of S/N ratio due to noise generated in the BBD is prevented by setting the gain of the initial stage amplifier to 6dB.

• Graphic Equalizer

The circuit enclosed by the dotted lines in the above diagram (Fig. 3) is equivalent to a simple inductance and resistance circuit connected in series to the IC1-1 circuit at point A. The desired frequency resonance circuit is thus formed by C1 and the inductance circuit.
An equalizer variable resistor (VR1) has been connected across the inverted and non-inverted inputs of IC1-1. If the VR setting is shifted towards the non-inverted input side from the center position, the circuit will be cut at the resonance frequency. Shifting in the opposite direction will result in a boosting response.

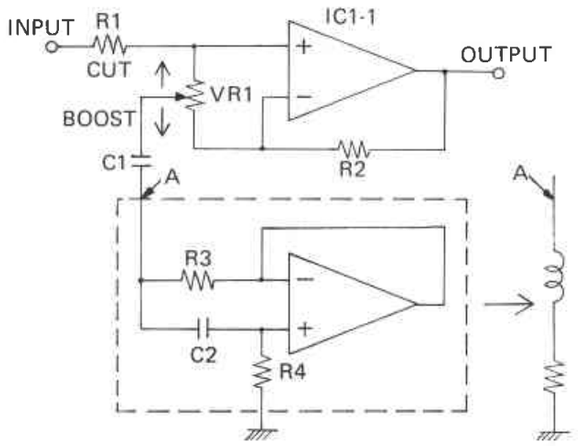


Fig. 3

3.1 BBD OUTPUT BALANCE ADJUSTMENT

- **Connection Diagram**

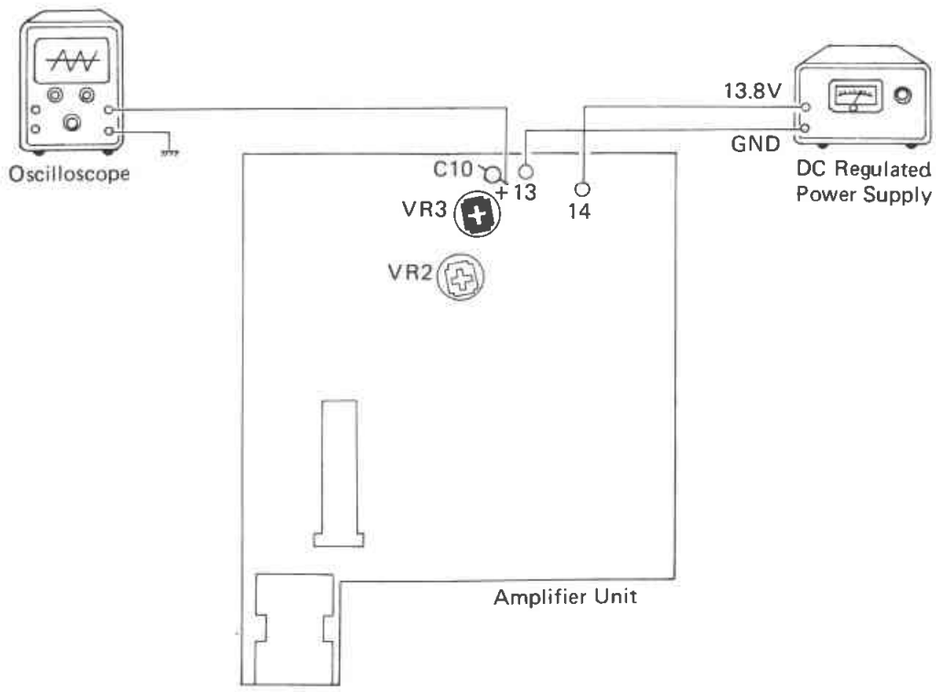


Fig. 4

DC Regulated power supply 13.8V
Oscilloscope
Vertical 5mV
Horizontal . . . . . 50 μsec.

- **To Adjust**

1. Adjust VR3 in order to reduce the amplitude of the oscilloscope waveform to a minimum, and obtain symmetry about the horizontal axis (see Fig. 5).

Before adjustment After adjustment

Fig. 5

3.2 BBD DC BIAS ADJUSTMENT

- **Connection Diagram**

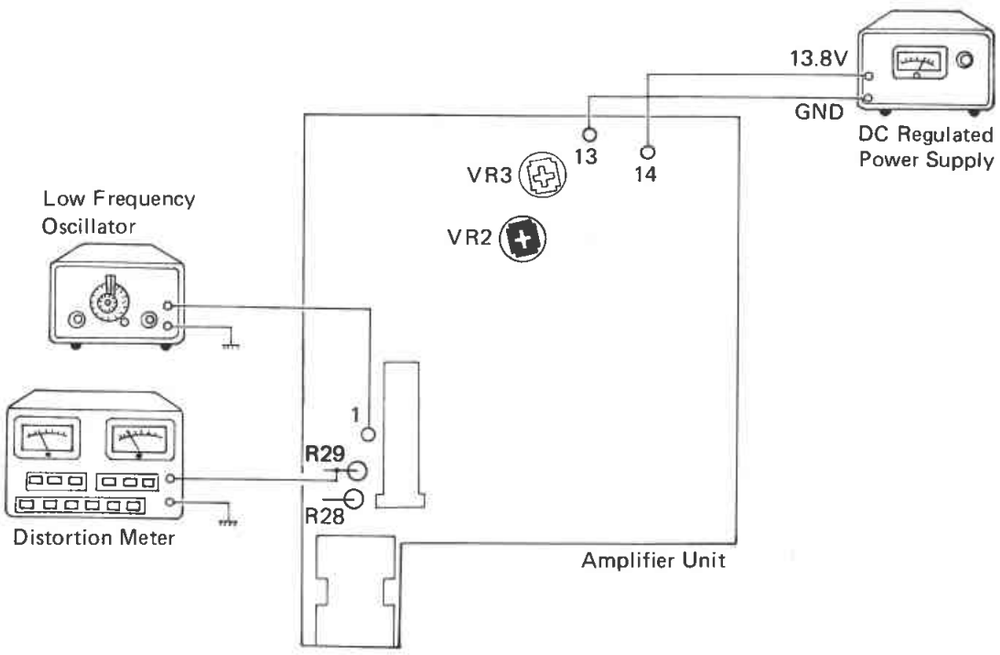


Fig. 6

DC Regulated power supply 13.8V
Low frequency oscillator
Output 1kHz, 150mV
Defeat switch . . . . . ON

- **To Adjust**

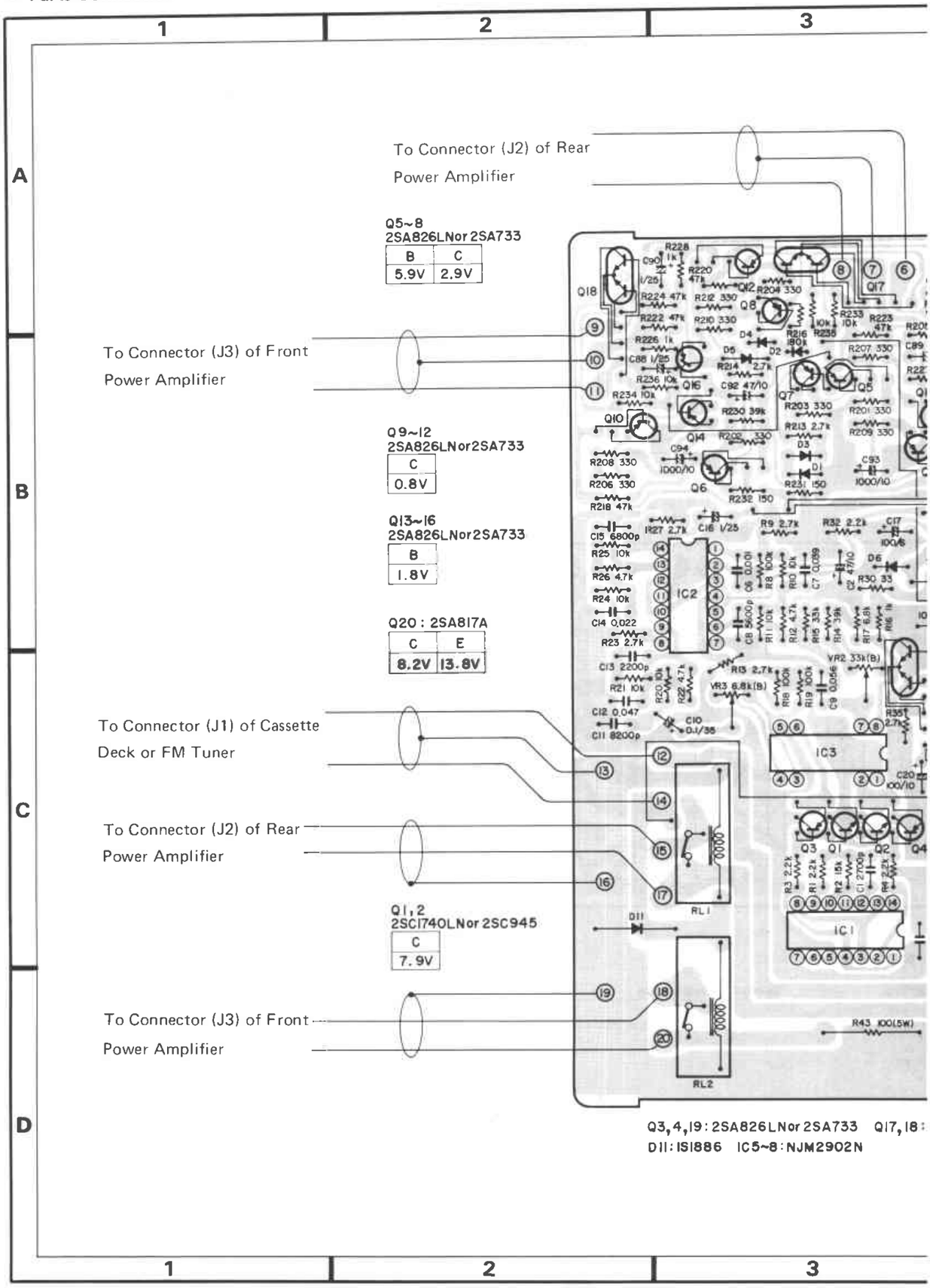
1. Bypass R28 by shorting it at both ends.
2. Adjust VR2 to find the position of minimum distortion (approx. 1.2%).

Notice: The connection diagram for CD-7/U, C Serial No. 00001 ~ 12000 is different. The method of adjustment is the same. Refer to the table below for wiring instructions.

BBD OUTPUT BALANCE ADJUSTMENT	BBD DC BIAS ADJUSTMENT
DC Regulated power supply +13.8V ..... pin of 16 GND ..... pin of 12 Oscilloscope R29	DC Regulated power supply +13.8V ..... pin of 16 GND ..... pin of 12 Low frequency oscillator ..... pin of 2 Distortion meter C10

8. AMPLIFIER UNIT

- Parts Connection



AMPLIFIER UNIT

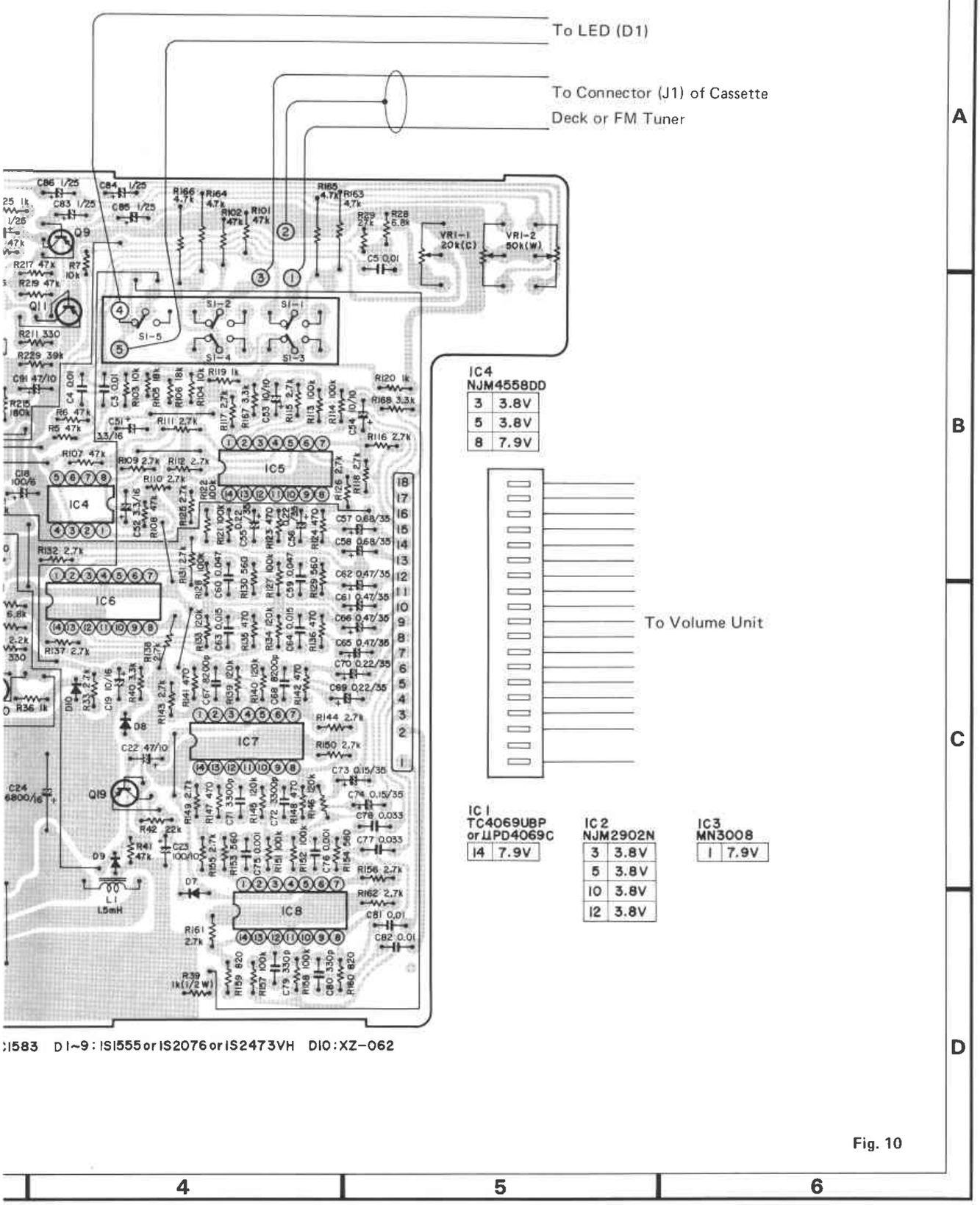


Fig. 10

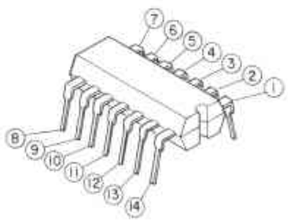
• IC's and Transistors

2SA733
2SA826LN
2SC644
2SC1740LN

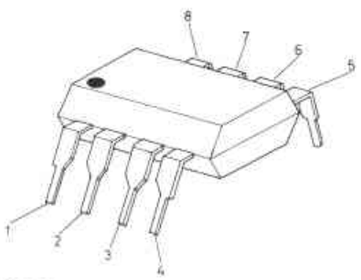
2SA817A

2SC1583

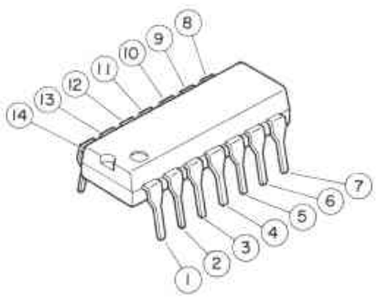
TC4069UBP
TA75902P
μPD4069C



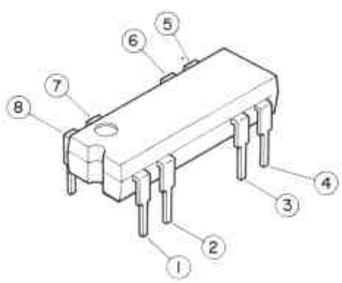
NJM4558DD

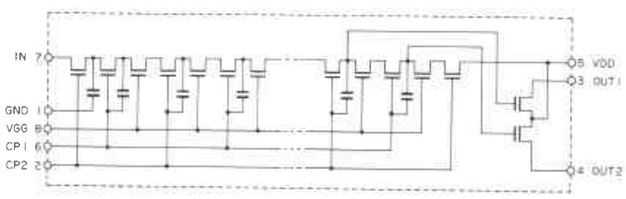


NJM2902N



MN3008





6. MISCELLANEOUS PARTS LIST

Part No.	Symbol & Description	
GL-2PG1	D1	LED
CDE-572	J1	Connector
CDE-573	J2	Connector
CDE-580	J3	Connector

7. VOLUME UNIT

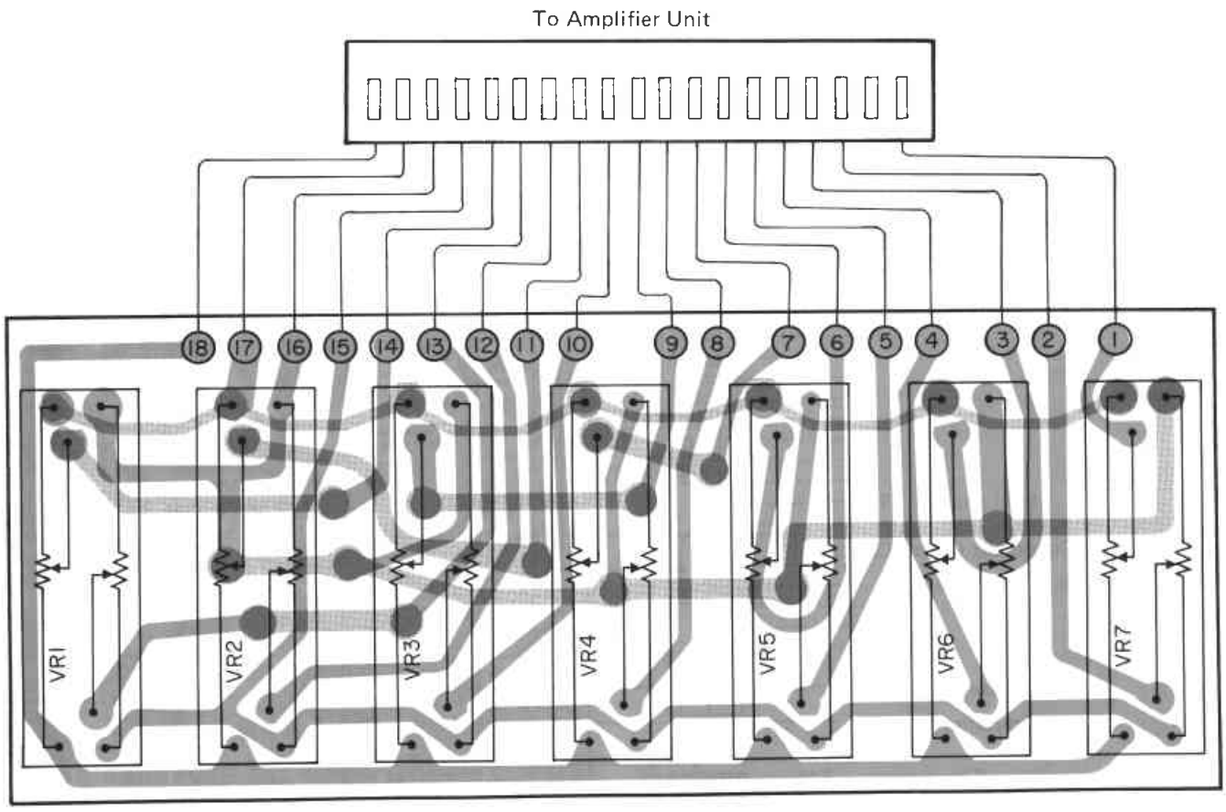
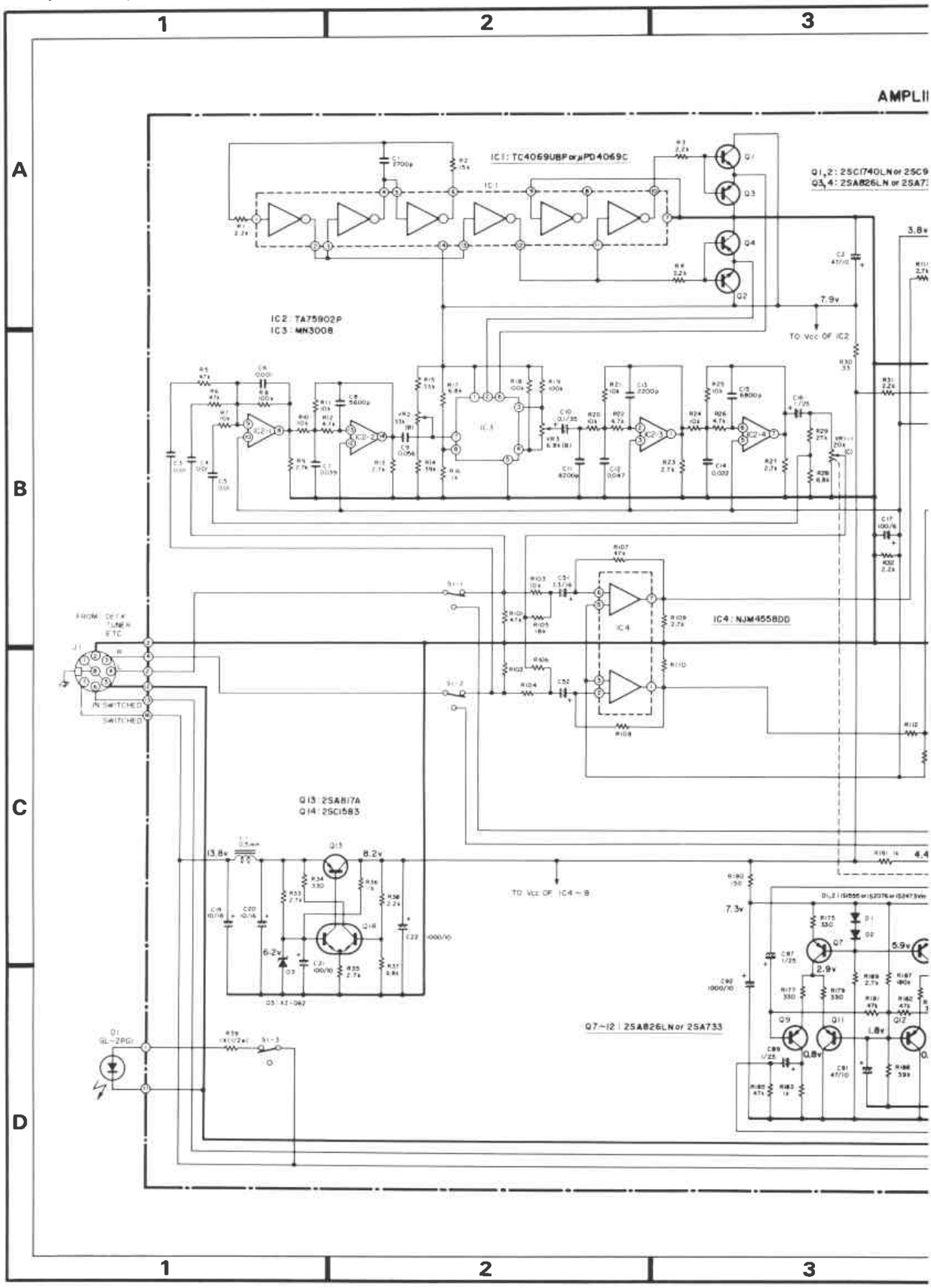


Fig. 9

Parts List

Part No.	Symbol & Description	
CCS-210	VR1–VR7	Volume, 20kΩ (W)

5. SCHEMATIC CIRCUIT DIAGRAM
(CD-7/U,C Serial No.00001~12000)



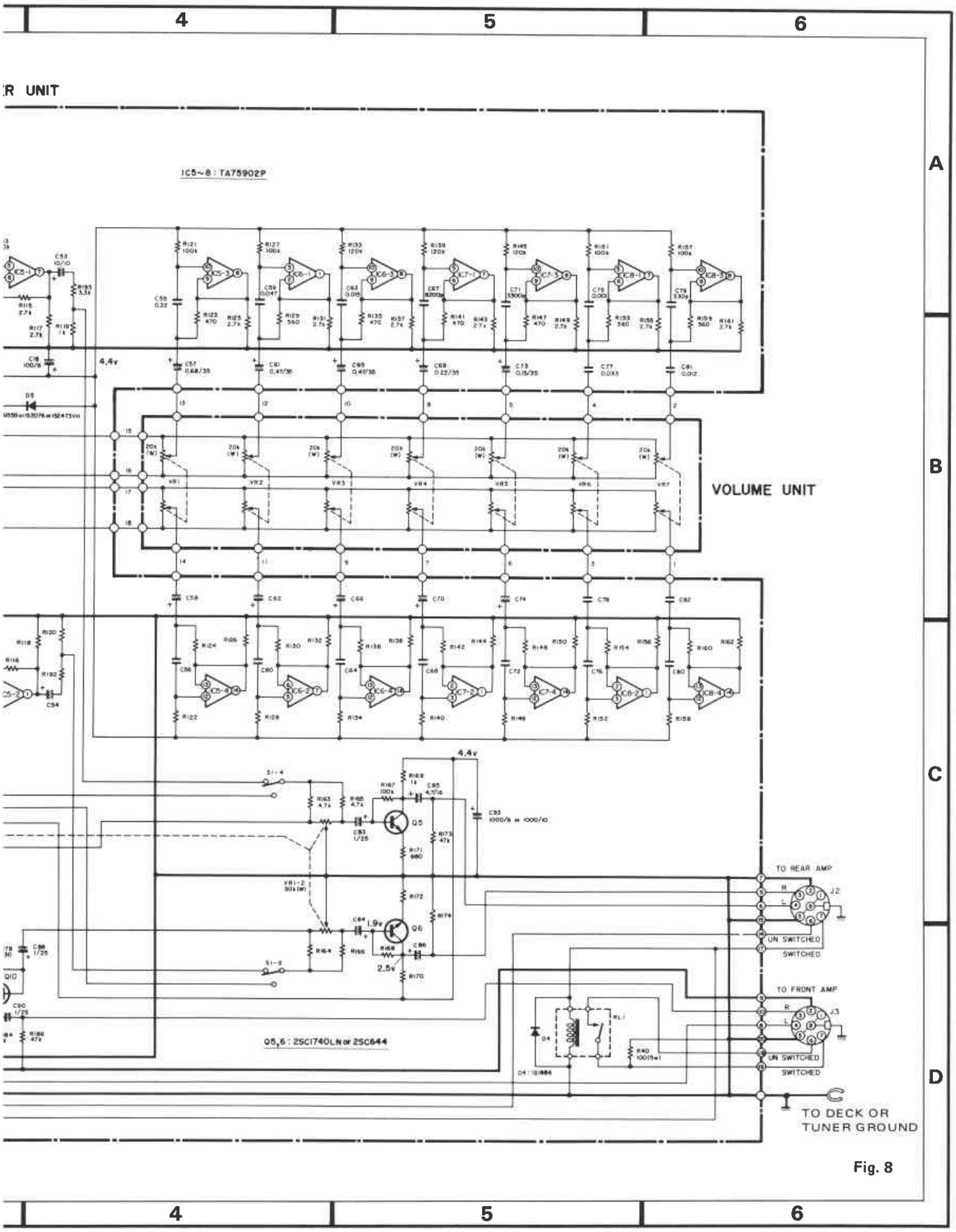
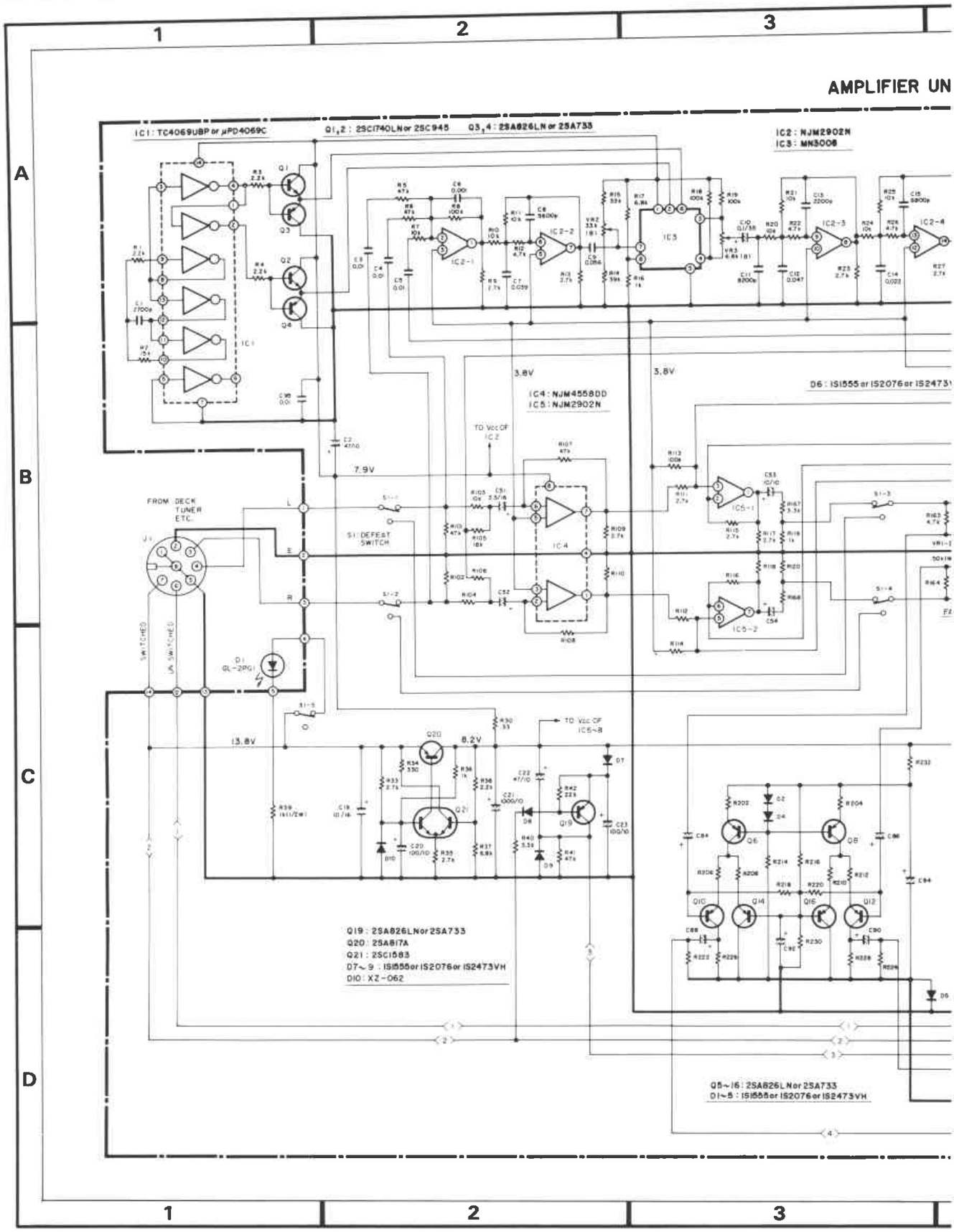

4
5
6
R UNIT
IC5~8 : TA7590ZP
VOLUME UNIT
4.4v
1.9v
2.5v
Q5
Q6
Q5,6 : 2SC1740LN or 2SC644
TO REAR AMP
TO FRONT AMP
UN SWITCHED
SWITCHED
TO DECK OR
TUNER GROUND
A
B
C
D

Fig. 8

4. SCHEMATIC CIRCUIT DIAGRAM



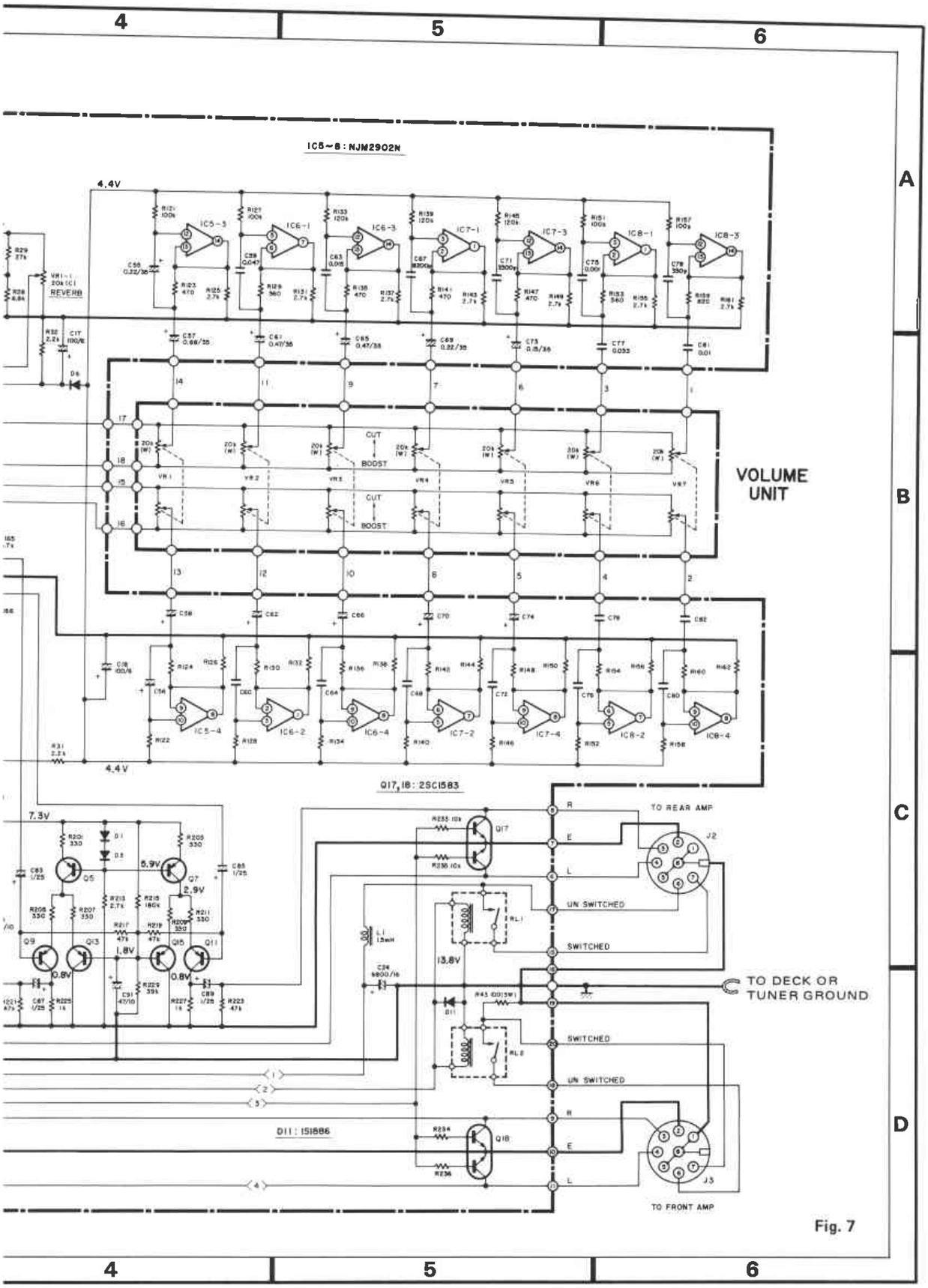
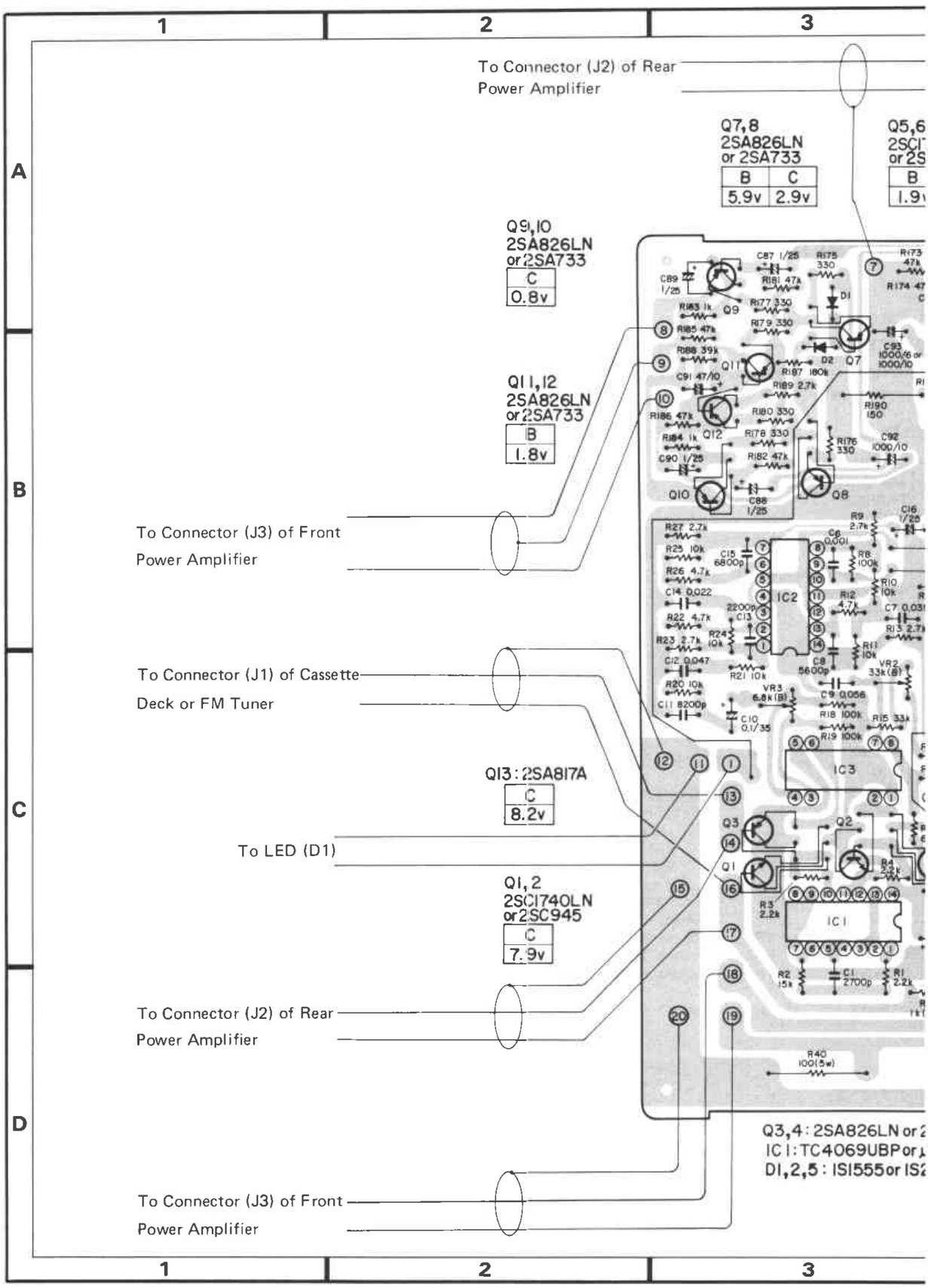

4
5
6
A
B
C
D
IC5~8 : NJM2902N
4.4V
REVERB
VOLUME
UNIT
CUT
BOOST
Q17, 18 : 2SC1583
7.3V
5.9V
2.9V
1.8V
0.8V
13.8V
TO REAR AMP
J2
R
E
L
UN SWITCHED
SWITCHED
TO DECK OR
TUNER GROUND
D11 : 1S1886
TO FRONT AMP
J3

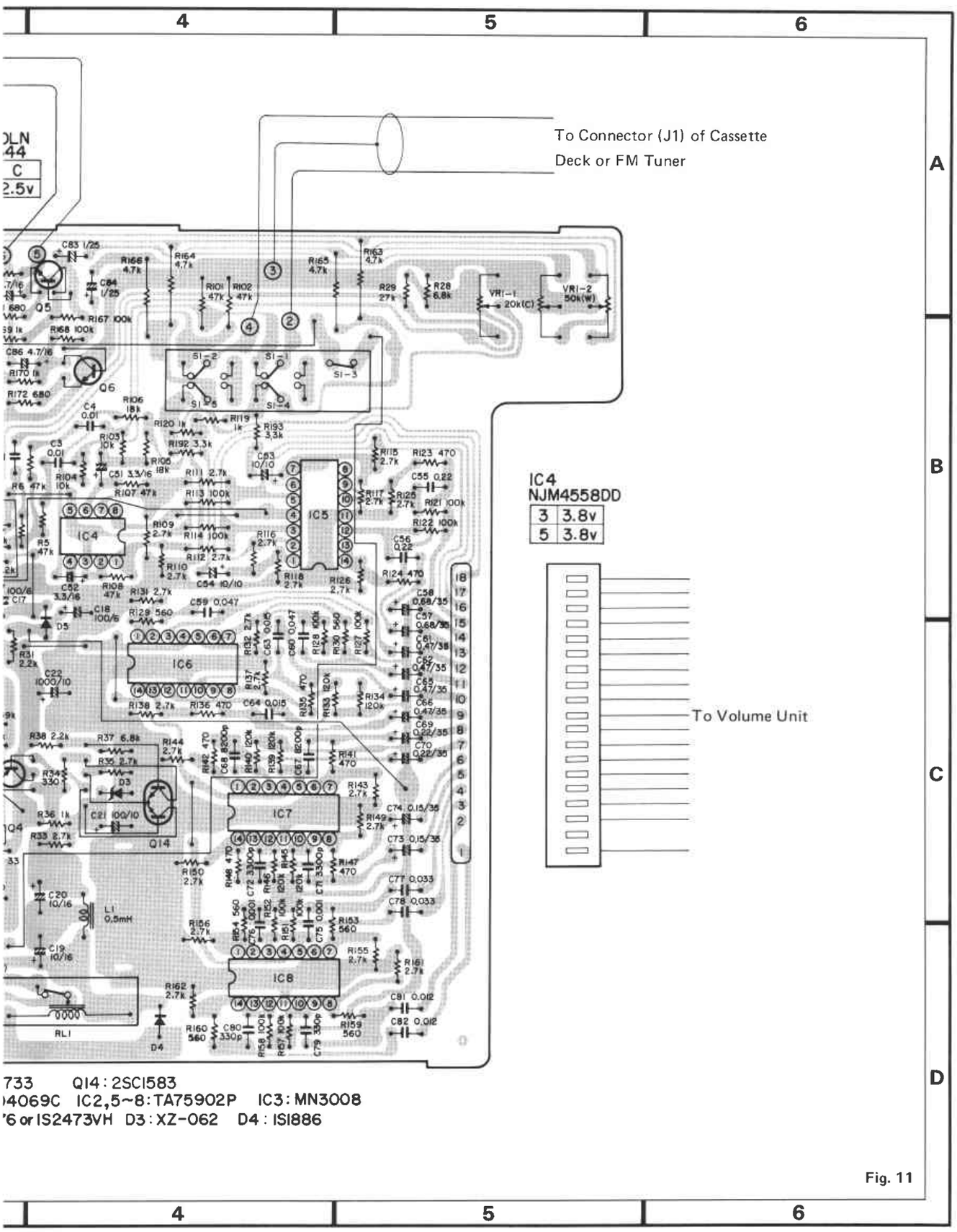
Fig. 7

AMPLIFIER UNIT (CD-7/U, C Serial No. 00001~12000)

- Parts Connection



AMPLIFIER UNIT (CD-7/U, C Serial No. 00001~12000)



733 Q14 : 2SC1583
)4069C IC2,5~8 : TA75902P IC3 : MN3008
'6 or IS2473VH D3 : XZ-062 D4 : ISI886

Fig. 11

• Parts List

NOTE:
When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex. 1 . When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	*56×10¹*	*561*	*RD1/4PS 5 6 1 J*
47kΩ	*47×10³*	*473*	*RD1/4PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562×10¹*		*RN1/4SR 5 6 2 1 F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*

MISCELLANEOUS

NOTICE: As for the Q1–Q16 use the same ones and the same rank for both channels.

Part No.	Symbol & Description	
TC4069UBP or μPD4069C	IC1	
NJM2902N	IC2, IC5–IC8	
MN3008	IC3	
NJM4558DD	IC4	
2SC1740LN-R, S or 2SC945-P, K	Q1, Q2	
2SA826LN-R, S or 2SA733-P, K	Q3, Q4, Q19	
2SA826LN-R or 2SA733-P	Q5–Q16	
2SC1583	Q17, Q18, Q21	
2SA817A-Y	Q20	
1S1555 or 1S2076 or 1S2473VH	D1–D9	
XZ-062	D10	
1S1886	D11	
CTF-115	L1	Coil, 1.5mH
CSG-126	S1	Switch
CCS-209	VR1	Volume, 50kΩ(W)/20kΩ(C)
CCP-036	VR2	Volume, 33kΩ(B)
CCP-095	VR3	Volume, 6.8kΩ(B)
CSR-017	RL1, RL2	Relay

RESISTORS

Part No.	Symbol & Description	
RD¼VS □□□J	R1–R19, R21–R27, R30–R38, R40–R42 R101–R162, R167, R168, R201–R236	
RD¼PS □□□J	R20, R28, R29, R163–R166	
RD½VS 102J	R39	
CCN-061	R43	100Ω/5W

CAPACITORS

Part No.	Symbol & Description	
CQMAH 272K 50	C1	
CEAH 470M 10L	C2, C22, C91, C92	
CQMAH 103K 50	C3–C5, C81, C82	
CQMAH 102K 50	C6, C75, C76	
CQMAH 393K 50	C7	
CQMAH 562K 50	C8	
CQMAH 563K 50	C9	
CSZAH 0R1M 35	C10	
CQMAH 822K 50	C11, C67, C68	
CQMAH 473K 50	C12, C59, C60	
CQMAH 222K 50	C13	
CQMAH 223K 50	C14	
CQMAH 682K 50	C15	
CSZAH 010M 25	C16, C83–C90	
CEAH 101M 6L	C17, C18	
CEAH 100M 16L	C19	
CEAH 101M 10L	C20, C23	
CEA 102M 10L	C21, C93, C94	
CCH-051	C24	6800μ/16V
CSZAH 3R3M 16L	C51, C52	

Part No.	Symbol & Description
CSZAH 100M 10	C53, C54
CSZAH R22K 35	C55, C56, C69, C70
CSZAH R68K 35	C57, C58
CSZAH R47K 35	C61, C62, C65, C66
CQMAH 153K 50	C63, C64
CQMAH 332K 50	C71, C72
CSZAH R15K 35	C73, C74
CQMAH 333K 50	C77, C78
CCDSL 331K 50	C79, C80
CQMAH 103K 50	C95

9. AMPLIFIER UNIT(CD-7/U,C Serial No.00001～12000)

Parts List

MISCELLANEOUS

NOTICE: As for the Q1–Q12 use the same ones and the same rank for both channels.

Part No.	Symbol & Description	
TC4069 UBP or μPD4069C	IC1	
TA75902P	IC2, IC5–IC8	
MN3008	IC3	
NJM4558DD	IC4	
2SC1740LN-R, S or 2SC945-P, K	Q1, Q2	
2SA826LN-R, S or 2SA733-P, K	Q3, Q4	
2SC1740LN-R, S	Q5, Q6	
or 2SC644-R, S		
2SA826LN-R or 2SA733-P	Q7–Q12	
2SA817A-Y	Q13	
2SC1583	Q14	
1S155 or 1S2076 or 1S2473VH	D1, D2, D5	
XZ-062	D3	
1S1886	D4	
CTF-002	L1	Coil, 0.5mH
CSG-126	S1	Switch
CCS-209	VR1	Volume, 50kΩ(W)/20kΩ(C)
CCP-036	VR2	Volume, 33kΩ(B)
CCP-095	VR3	Volume, 6.8kΩ(B)
CSR-017	RL1	Relay

RESISTORS

Part No.	Symbol & Description
RD¼VS □□□J	R1–R19, R21–R27, R30–R38, R101–R162, R167–R189, R191–R193
RD¼PS □□□J	R20, R28, R29, R163–R166, R190
RD½VS □□□J	R39
CCN-061	R40 100Ω/5W

CAPACITORS

Part No.	Symbol & Description
CQMAH 272K 50	C1
CEAH 470M 10L	C2, C91
CQMAH 103K 50	C3–C5
CQMAH 102K 50	C6, C75, C76
CQMAH 393K 50	C7
CQMAH 562K 50	C8
CQMAH 563K 50	C9
CSZAH 0R1M 35	C10
CQMAH 822K 50	C11, C67, C68
CQMAH 473K 50	C12, C59, C60
CQMAH 222K 50	C13
CQMAH 223K 50	C14
CQMAH 682K 50	C15
CSZAH 010M 25	C16, C83, C84, C87–C90
CEAH 101M 6L	C17, C18
CEAH 100M 16L	C19, C20
CEA 101M 10L	C21
CEA 102M 10L	C22, C92
CSZAH 3R3M 16L	C51, C52
CSZAH 100M 10	C53, C54
CSZAH R22K 35	C55, C56, C69, C70
CSZAH R68K 35	C57, C58
CSZAH R47K 35	C61, C62, C65, C66
CQMAH 153K 50	C63, C64
CQMAH 332K 50	C71, C72
CSZAH R15K 35	C73, C74
CQMAH 333K 50	C77, C78
CCDSL 331K 50	C79, C80
CQMAH 123K 50	C81, C82
CSZAH 4R7M 16	C85, C86
CEA 102M 10L	C92
CEA 102M 6L or CEA 102M 10L	C93

11. PACKING METHOD

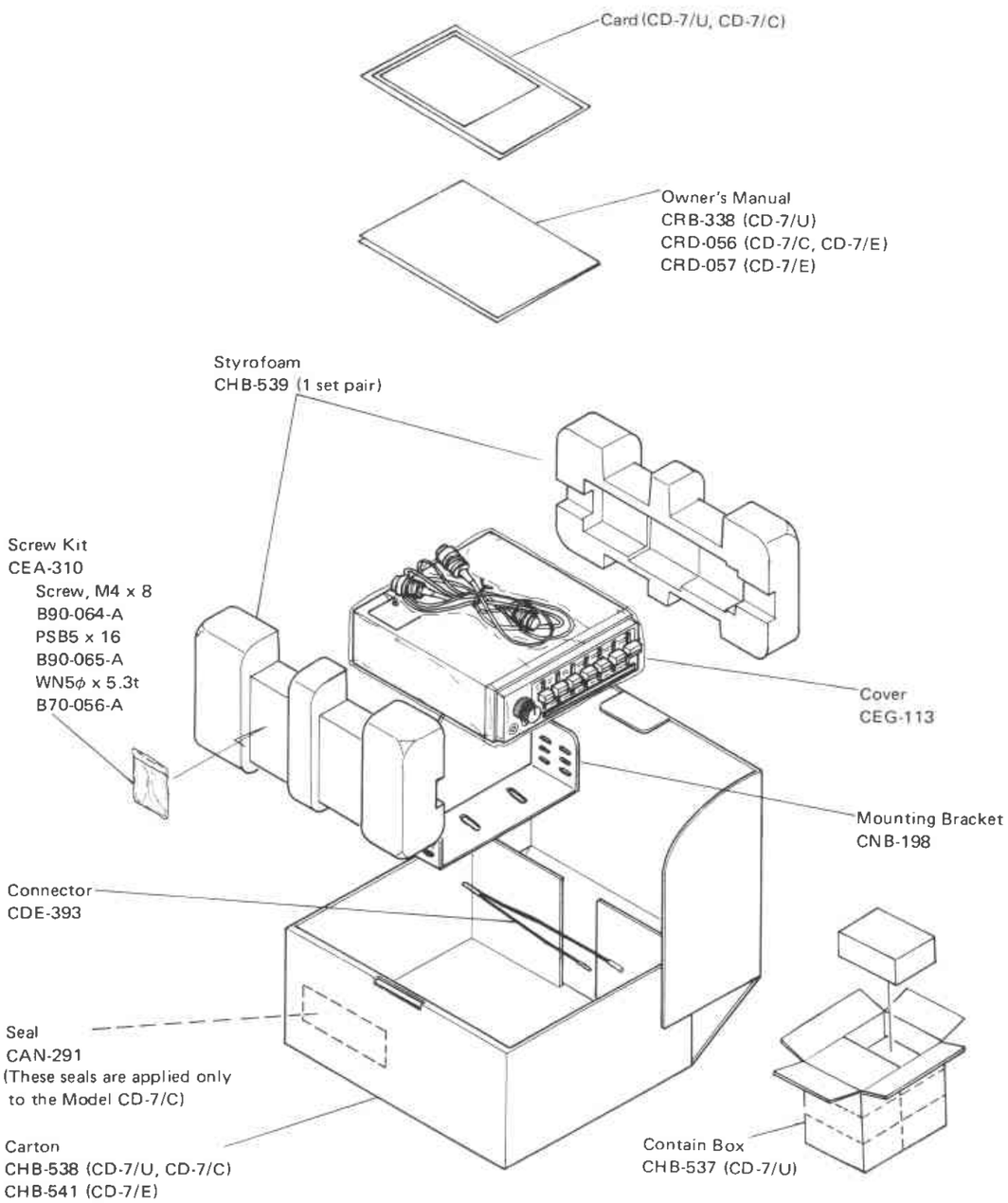


Fig. 13

PIONEER ELECTRONIC CORPORATION
4-1, Meguro 1 chome, Meguro-ku, TOKYO, 153, JAPAN
PIONEER ELECTRONICS OF AMERICA
1925 E. Dominguez St. Long Beach, Calif. 90810
PIONEER ELECTRONIC (EUROPE) N.V.
Luithagen-Haven 9, 2030 Antwerp, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD.
178-184 Boundary Road, Braeside, Victoria 3195, Australia

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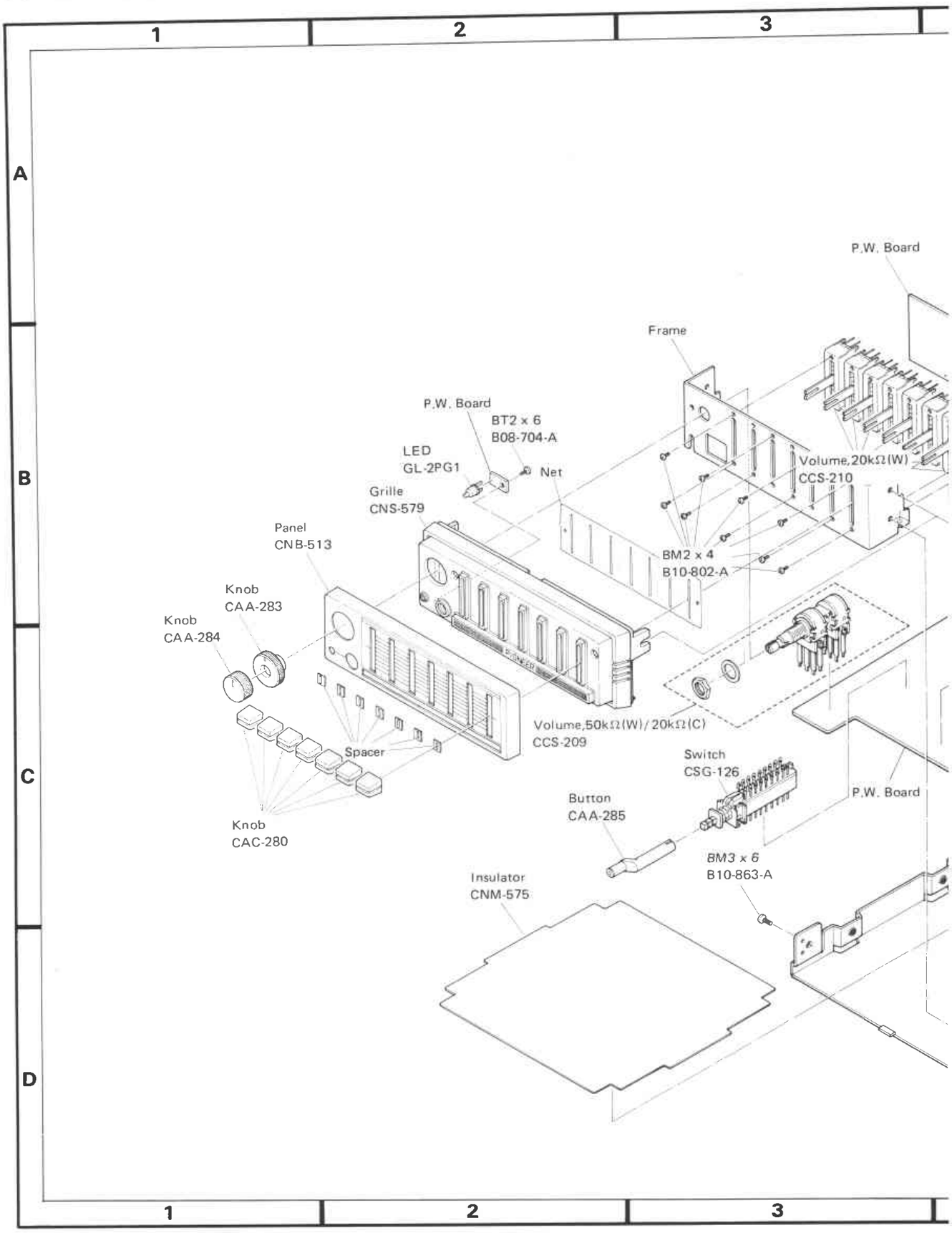
< CRT-173-0 >
Printed in Japan

<79D05F11K>

10. EXPLODED VIEW



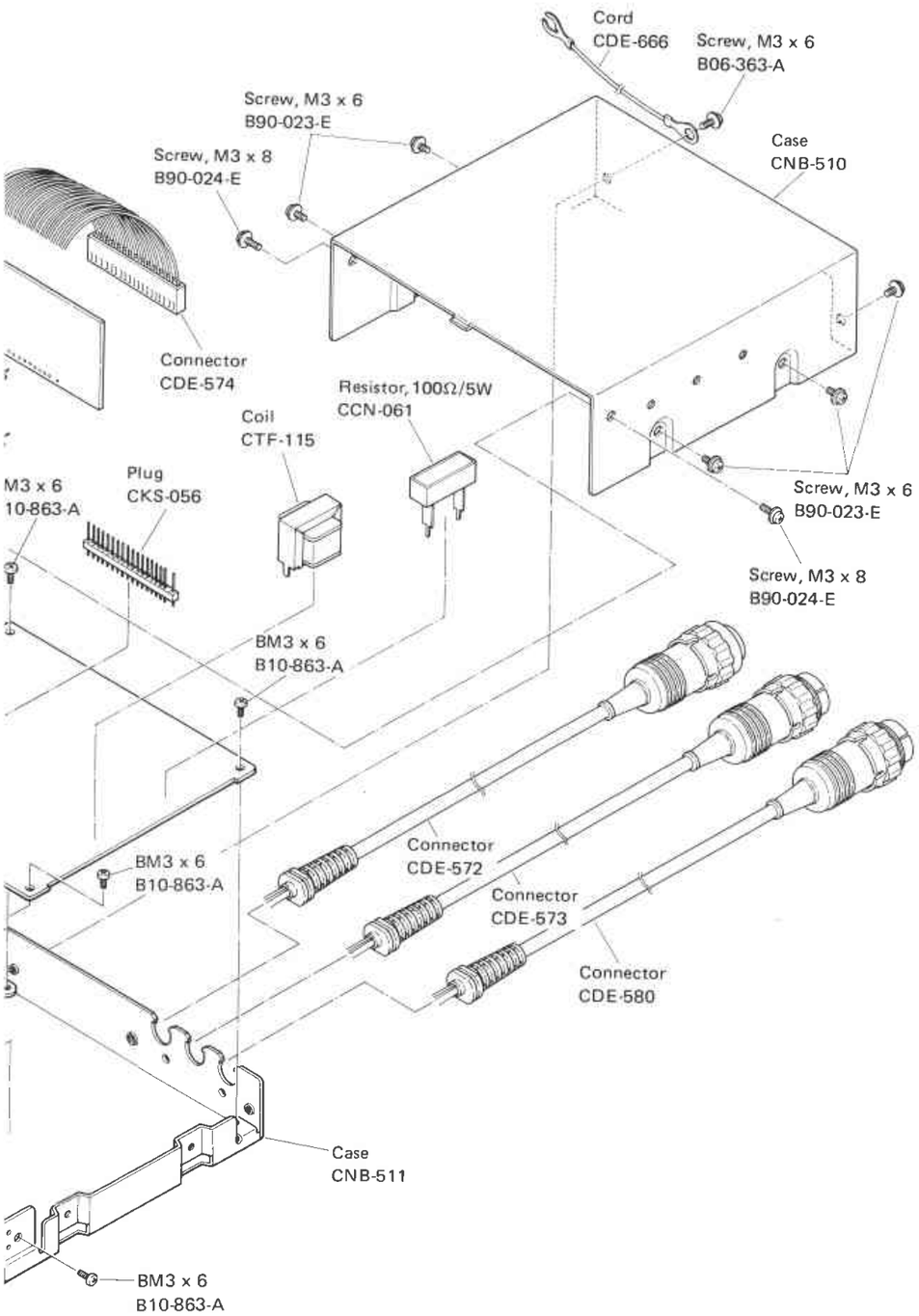

Cord
CDE-666
Screw, M3 x 6
B06-363-A
Screw, M3 x 6
B90-023-E
Screw, M3 x 8
B90-024-E
Case
CNB-510
Connector
CDE-574
Resistor, 100Ω/5W
CCN-061
Coil
CTF-115
Plug
CKS-056
M3 x 6
10-863-A
Screw, M3 x 6
B90-023-E
Screw, M3 x 8
B90-024-E
BM3 x 6
B10-863-A
BM3 x 6
B10-863-A
Connector
CDE-572
Connector
CDE-573
Connector
CDE-580
Case
CNB-511
BM3 x 6
B10-863-A

Fig. 12